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FIVE NEW POLYCHAETES OF THE FAMILIES EUNICIDAE AND ONUPHIDAE, COLLECTED IN 1975 AND 1976 DURING THE SOUTHERN CALIFORNIA BASELINE PROJECT

John F. Shisko

Abstract.—*Eunice caeca, E. multicylindri, Nothria exigua, Onuphis multiannulata,* and *O. segmentispadex* are described from the Southern California Bight.

Introduction

In a baseline study of the Southern California Bight, funded by the Bureau of Land Management in 1975, 777 stations were sampled between September 1975 and April 1976. The benthic samples used in the present study, listed in Appendix 1, were taken aboard the R/V *Velero* with a box coring device $^1/_{16}$ m^2. The samples were then sequentially washed through sieves with 1.0 mm and 0.5 mm meshes respectively, saturated with magnesium chloride in sea water for 30 minutes to relax the specimens, fixed in 10% formaldehyde, and stored in 70% ethanol.

Eunice caeca, new species
Fig. 1, Table 1

Material.—24774 (1, type).

Description.—The type is complete with 90 setigers. The pygidium is in the process of regeneration. The specimen is 110 mm long and 6 mm wide including the parapodia. A color pattern is lacking. The ventrum is deeply concave from setiger 4–6.

The prostomium is as long as wide with a fairly deep median cleft. Eyespots are absent; however, a patch of pigment is located posterior to the bases of the outer lateral occipital antennae. The occipital antennae are composed of cylindrical articles of irregular length. The outer lateral ones have 4 to 5 articles and barely reach setiger 1. The inner lateral antenna is incomplete. Irregular wrinkles on the tentacles add to the difficulty in counting articles. The first peristomial segment is longer than the prostomium and is 3 times as long as the second peristomial segment. The second peristomial segment bears the peristomial cirri. The peristomial cirri are wrinkled, equal the dorsal cirri of setiger 5 in both length and shape, and reach to the bases of the outer lateral occipital tentacles.

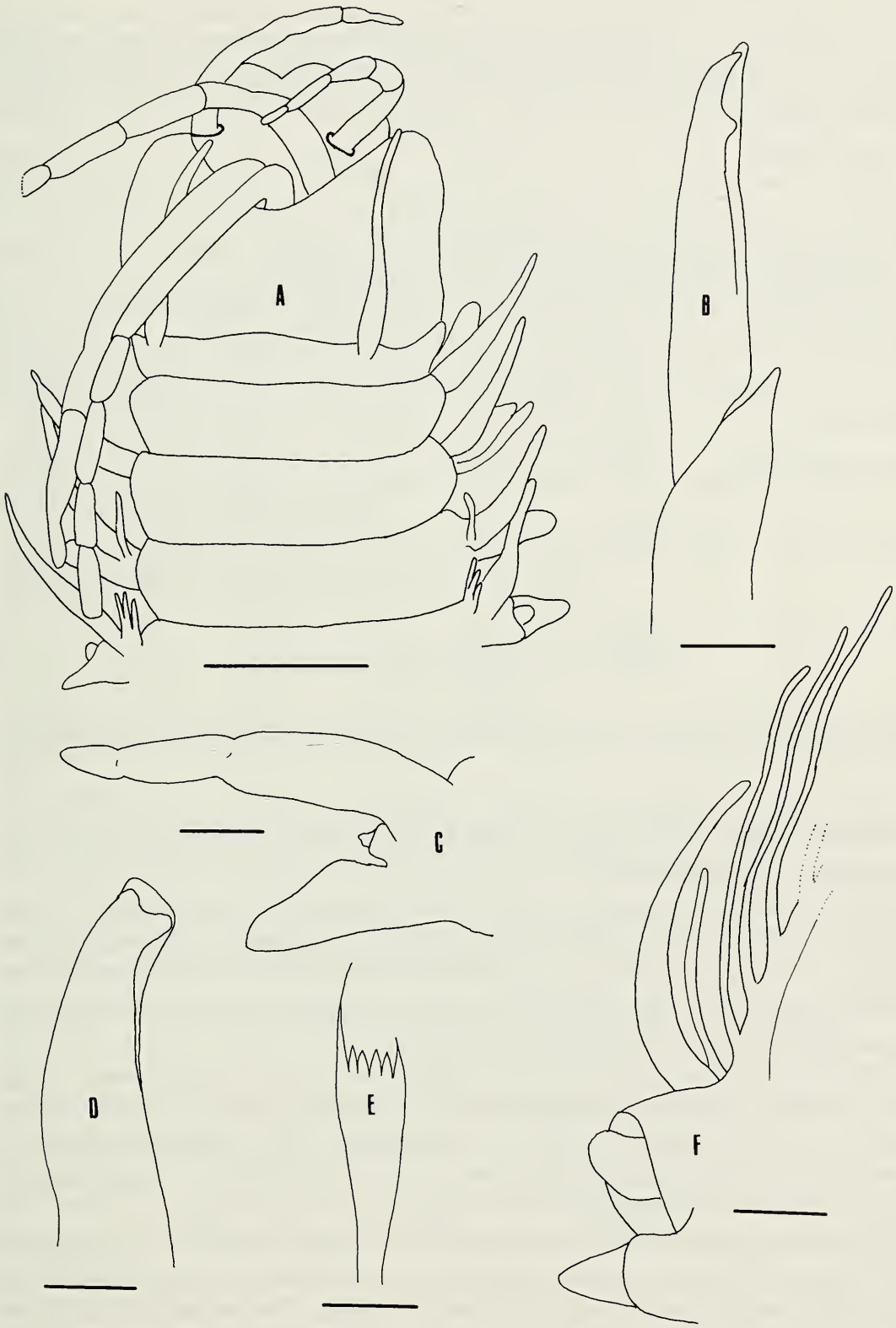

Fig. 1. *Eunice caeca:* A, Anterior end, dorsal view; B, Composite falciger, setiger 1; C, Parapodium, setiger 1; D, Subacicular hook, setiger 43; E, Pectinate seta, setiger 1; F, parapodium, setiger 9. Scales: A = 2.0 mm; B = 0.012 mm, C = 0.5 mm; D = 0.05 mm; E = 0.025 mm; F = 0.5 mm.

Table 1.—Material of Eunicidae from the Southern California Baseline Project. The table gives measurements on part of the material; the total number of specimens of each species can be found in the systematic account. The data in columns 3–6 refer to the number of setigers counted from the anterior end. A question mark indicates that the information was unattainable. The columns are:

1. Station number.
2. Length in mm, measured from the tip of the palpi to the posterior margin of the tenth setiger.
3. The number of the setiger on which the first branchia occurred.
4. The number of the setiger on which the last branchia occurred.
5. The number of the setiger on which the first subacicular hook occurred.
6. The total number of setigers present in fragmentary specimens.

	1.	2.	3.	4.	5.	6.
Eunice caeca	24774	14.4	2–3	46	42	
Eunice multicylindri	22952	2.5	3	27	19	44
		2.0	3	14	13	29
	23170	2.3	3	27	21	
	24356	3.0	3	?	24	31
		3.5	3	35	25	40
		2.4	3	26	21	
	TYPE	3.5	3	35	26	
	24367	2.7	3	31	22	
		3.0	3	36	26	
		2.5	3	35	26	56

The first setiger has a transverse presetal lobe, a conical setal lobe, and a transverse postsetal lobe.

The dorsal cirrus is long and slender in all segments, but is thicker in the first 5 or 6 setigers. The ventral cirri are short and stout in all setigers; from setiger 7 they have a knoblike tip on a stout base. The ventral cirri become cirriform posterior to the branchial segments. Neither dorsal or ventral cirri are annulated. The dorsal cirri are wrinkled.

Branchiae are first present from setiger 2 on one side, and from setiger 3 on the other side as a single filament. Branchiae are in a pectinate arrangement from setiger 5 with 3 to 5 filaments. The maximal number of filaments is 23. The branchiae cover the dorsum completely from setiger 8 to 40, and are present posteriorly to setiger 46.

Composite hooded hooks, capillary setae, and pectinate setae are present in all setigers. The composite, bidentate hooded hooks have a blunt hood which does not project beyond the tip of the hook. The hoods and the upper ends of the basal shafts are finely serrate. The capillary setae are straight and finely serrate along their entire length. Pectinate setae are straight; each has 4–7 teeth with only one margin drawn out into a fine tip. Yellow sub-

acicular hooded hooks are first present from setiger 42; each is bidentate; up to 3 hooks may be present in posterior parapodia.

The pharyngeal apparatus is exposed in the type. Maxilla I is falcate; maxilla II has 6 teeth on the left and 5 teeth on the right; right combined maxilla III and IV has 8 teeth, left maxilla IV has 7 teeth. Each maxilla V has 1 tooth.

Discussion.—*Eunice caeca* closely resembles *E. semisegregata* Fauchald, 1969. The first branchia are pectinate with 6 filaments in *E. semisegregata* whereas the first branchia of *E. caeca* consists of a single filament. The maximum number of filamenta is 34–36 in *E. semisegregata*; the maximum is 24 in *E. caeca*. Subacicular hooks are present from setiger 51 in *E. semisegregata* and are present from setiger 42 in *E. caecus*.

Distribution.—*Eunice caeca* has been found at only one location, in trawl material near Tanner Bank at a depth of 1357 m.

Disposition of types.—Holotype is deposited in the National Museum of Natural History (USNM 63065).

Etymology.—The specific name is derived from the Latin "caecus" meaning blind; it is given because eyespots are absent.

Eunice multicylindri, new species
Fig. 2, Table 1

Material.—22952 (2); 22999 (1); 23087 (2); 23170 (1); 24356 (5, type); 24367 (4).

Description.—The type is complete with 115 setigers. It is 43 mm long and 1 mm wide. The specimen is uniformly pale yellow with a thin transverse line of red at the intersegmental furrows. This pigmentation disappears a year or so after preservation. Dark internal masses are present in each parapodium from setiger 25. There are 2 pairs of anal cirri. The dorsal pair is 3–5 times the length of the ventral pair.

The prostomium is nearly as long as it is wide and has a narrow shallow frontal incision. A pair of dark red eyes is located at the base of the inner lateral occipital tentacles. These eyes turn black a year or so after preservation. The outer lateral tentacles reach the first setiger and are made up of 4 cylindrical articles. The inner lateral occipital tentacles reach to setigers 4–5 and have 7 cylindrical articles of which the longest is the ceratophore. The median occipital tentacle is the longest and reaches setiger 6–7, it is made up of 7 cylindrical articles. The first peristomial segment is only slightly longer than the second. The combined lengths of the first and second peristomial segments is equal to the length of the peristomium. The peristomial cirri are equal in length but shorter than the dorsal cirrus of the first setiger. Neither the peristomial cirri nor the dorsal cirri possess articulations.

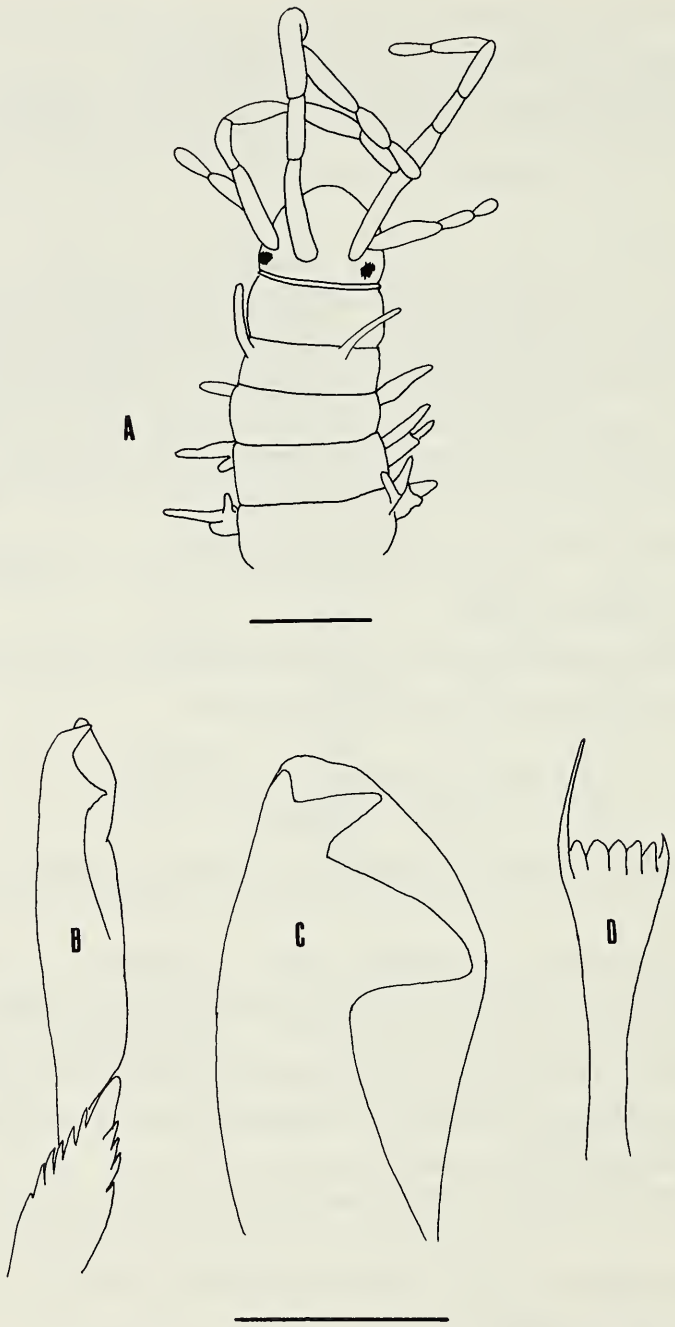

Fig. 2. *Eunice multicylindri:* A, Anterior end, dorsal view; B, Hooded hook, setiger 5; C, Subacicular hook, setiger 68; D, Pectinate seta, setiger 5. Scales: A = 0.5 mm; B–D = 0.025 mm.

The first setiger has a truncate presetal lobe which is continuous with an obliquely truncate postsetal lobe. The setal lobe lies between the presetal and postsetal lobes in a dorsal position and appears as a knoblike projection from which a blunt aciculum emerges. Dorsal cirri are slender throughout.

Ventral cirri are slender in the first 5 or 6 setigers and then become barrel shaped.

Branchiae are present from setiger 3 and disappear at setiger 25. They are simple on setigers 3–9. There are maximally 3 pectinately arranged filaments present. Each branchial filament is long and slender.

Composite hooded hooks, pectinate setae and capillary setae are present in all setigers. The composite bidentate hooded hooks have blunt hoods which are serrated along one margin. The distal end of the shaft is also serrate. The pectinate setae have 7 teeth and only one edge is drawn out into a slender top. The capillary setae are straight and are finely serrate along one margin. Yellow tridentate acicular hooks occur singly from setiger 19–25.

Tubes are absent.

The jaws were not dissected in any of the specimens.

Discussion.—Eunice multicylindri is closely related to both *E. vittata* (Delle Chiaje, 1828) and *E. vittatopsis* Fauchald, 1970. *E. vittata* and *E. vittatopsis* both possess articled peristomial and dorsal cirri. The cirri of *E. multicylindri* are smooth.

Distribution.—Eunice multicylindri is found from Santa Rosa Island to Tanner Bank in coarse sand. Its bathymetric range is 70–129 m.

Disposition of types.—Holotype and paratypes are deposited in the National Museum of Natural History (USNM 63066, 63067, 63068, 63069, 63070).

Etymology.—The specific name is derived from the Latin "multus" meaning many and the Greek "cylindrus" meaning cylinder; it is given because the tentacles are made up of a number of cylindrical articles.

Nothria exigua, new species
Fig. 3, Table 2

Material.—22958 (1); 22960 (1); 22965 (1); 22966 (1); 23004 (7); 23070 (18); 23077 (1); 23086 (7); 23087 (1); 23088 (7); 23092 (4); 23093 (1); 23100 (7); 23205 (10); 23229 (1); 24080 (56, type); 24081 (60); 24083 (9); 24084 (25); 24089 (2); 24100 (8); 24140 (2); 24365 (3); 24382 (5); 24384 (2).

Description.—The type is a nearly complete specimen with 99 setigers; it is 24 mm long and 1 mm wide. The dorsum of each anterior segment is crossed with a transverse bar of brown pigment, but the pigment fades and all segments posterior to setiger 25 are pale. The peristomium is uniformly brown. The pygidium terminates in 2 long anal cirri in complete specimens.

The prostomium is rounded with globular frontal antennae. The ceratophores of the occipital antennae have 3–4 annuli. The style of the median occipital tentacle reaches to setiger 9; the style of the outer lateral tentacles reaches to setiger 2 and the styles of the inner lateral tentacles reach to setiger

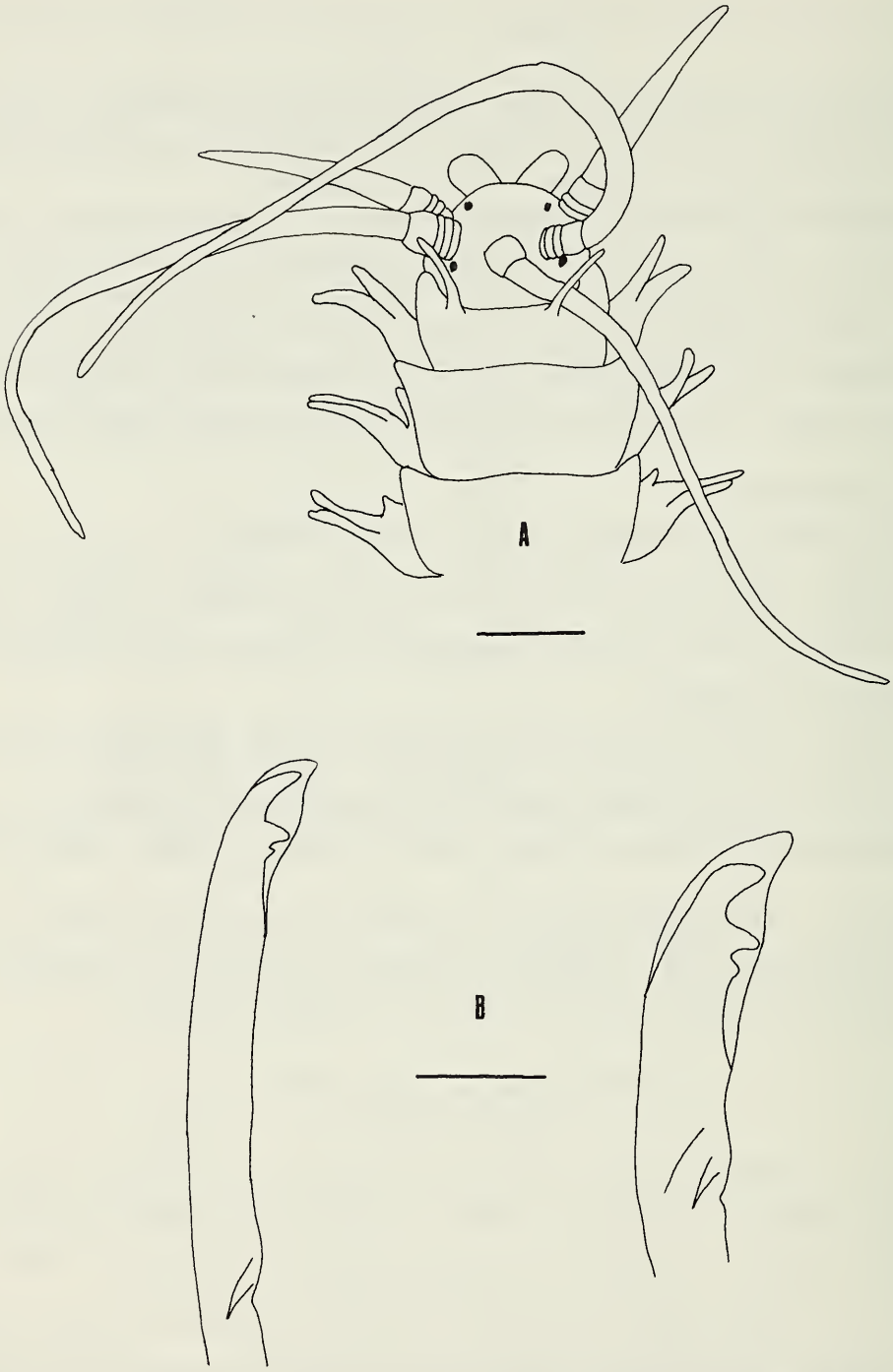

Fig. 3. *Nothria exigua:* A, Anterior end, dorsal view; B, Hooded hooks, setiger 1. Scales: A = 0.5 mm; B = 0.025 mm.

10. One pair of eyes is lateral to the inner occipital tentacle and another pair is located just posterior to the frontal antennae.

The first setiger has a transverse presetal lobe, the setal lobe is rounded and hooks project from both its anterior and posterior faces; the postsetal

Table 2.—Material of Onuphidae from the Southern California Baseline Project. The table gives measurements on part of the material; the total number of specimens of each species is found in the systematic account. A dash in a column means that the measurement does not apply, a question mark means that the measurement was unattainable. The data in columns 3–5 and 7–10 refer to the number of setigers counted from the anterior end. The columns are:

1. Station number.
2. Length in mm, measured from the tip of the palpi to the posterior margin of the tenth setiger.
3. The number of the setiger on which the first branchia occur.
4. The number of the setiger from which the ventral cirri become padlike.
5. The number of the setiger on which a pair of subacicular hooks first occur.
6. The number of annulations found on the ceratophore of the inner occipital tentacle.
7. The setiger to which the inner occipital tentacle reaches.
8. The number of anterior setigers with pseudocomposite hooks.
9. The first and last setiger in which composite spinigers occur.
10. The total number of setigers present in fragmentary specimens.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Nothria exigua									
22958	2.2	None	4	11	?	6	4	4–11	63
22960	2.6	None	4	11	3	6	4	5–12	?
24080	1.9	14	4	12	3	8	4	5–11	27
	1.5	14	4	11	3	9	3	5–11	
	1.7	12	4	12	3	11	3	4–11	
	2.0	14	4	13	3	8	4	4–12	27
	1.8	13	4	12	3	?	3	4–11	39
24089	2.0	13	4	11	4	7	?	4–12	39
	2.7	12	4	11	4	9	?	4–11	41
24100	2.6	11	4	15	4	?	4	5–12	81
	2.5	11	4	16	4	7	4	4–15	72
	2.0	14	4	15	3	6	4	5–14	100
24365	3.3	12	4	13	3	8	4	4–11	59
	2.8	13	4	14	3	10	3	4–13	28
	3.1	12	4	15	3	11	4	5–15	33
24382	1.9	16	5	14	4	11	4	5–13	33
	2.6	None	4	11	4	7	3	5–11	
	1.9	?	4	12	4	11	4	5–11	65
	2.6	20	4	12	4	?	4	4–12	29
TYPE	2.3	16	5	15	4	?	4	5–15	
24384	3.8	16	4	15	4	9	5	5–15	
	2.8	18	4	13	4	6	3	4–12	64
Onuphis multiannulata									
22966	4.2	1	6	10	23	23	4	—	101
24140	8.0	1	6	10	31	21	5	—	57
24380	5.1	1	7	10	28	21	6	—	38
24754	4.8	1	7	10	29	24	6	—	135
24759	4.5	1	8	10	26	22	7	—	137

Table 2.—Continued.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Onuphis segmentispadix									
22966	2.0	13	5	13	4	6	4	5–12	
23000	2.6	15	5	17	4	14	4	5–16	48
	2.0	13	5	17	3	13	3	5–16	60
23070	3.0	14	5	15	3	10	4	5–14	40
	2.6	14	5	16	4	11	4	5–15	
23100	4.1	10	5	18	4	11	4	5–16	90
24075	3.8	7	5	17	4	14	4	5–16	59
24080	3.2	10	5	18	4	17	5	5–16	55
24106	3.4	9	5	17	4	12	4	5–16	68
24240	1.4	14	4	12	3	11	3	5–11	
	1.9	12	5	13	3	16	3	4–12	69
	2.3	13	5	15	4	12	4	5–15	42

lobe is clavate, a fold on its anterior surface is visible just posterior to the setal lobe. Ventral cirri are first padlike from setiger 5.

Simple straplike branchiae are present from setiger 14–16.

Pseudocomposite tridentate hooded hooks are present in the first 4 setigers, accompianied by simple setae. Composite spinigers are present in setigers 5 through 15. A pair of subacicular hooks is present from setiger 16.

The tubes are thin and transparent.

Maxilla I is falcate; left maxilla II has 6 teeth, right maxilla II has 6 teeth; left maxilla III has 7 teeth, left maxilla IV has 7 teeth; and combined right maxilla III and IV has 8 teeth. Each maxilla V has 1 tooth.

Discussion.—*Nothria exigua* resembles both *N. rubrescens* (Augener, 1906) and *N. stigmatis* (Treadwell, 1922). *Nothria exigua* may be distinguished from *Nothria rubrescens* by the number of the annulations on the ceratophores. *Nothria exigua* has 3–4 annuli per ceratophore whereas these number 7–9 in *N. rubrescens*. *N. exigua* differs from *N. stigmatis* in that the branchia first occur before setiger 17 in *N. exigua* and after setiger 18 in *N. stigmatis*.

Disposition of types.—Holotype and paratypes are deposited in the National Museum of Natural History (USNM 63081, 63082, 63083, 63084, 63085).

Etymology.—The specific name is derived from the Latin "exiguus" meaning small; it is given because the animals are generally small.

Onuphis multiannulata, new species
Fig. 4, Table 2

Material.—22966 (1); 24140 (1, type); 24380 (1); 24754 (1); 24759 (1).

Description.—The type is incomplete with 57 setigers; it is 24 mm long

and 3 mm wide including the parapodia. A pigment pattern is lacking, except that each of the occipital ceratophores have 5–6 distal annuli with brown pigmentation.

The prostomium is ovate with globular frontal antennae. The occipital ceratophores are distinctly annulated. In all cases the distalmost annulus is the longest. The median ceratophore has 24 annuli and its style reaches to setiger 12; the outer lateral ceratophores have 23 annuli and the style reaches to setiger 23; the inner lateral ceratophores have 31 annuli and the style reaches to setiger 21. There is 1 pair of clustered eyespots lateral to the inner occipital ceratophores. The peristomial cirri are slender and equal in length to the dorsal cirri of the first setiger.

The presetal lobe of the first setiger is truncate, the setal lobe is rounded. The postsetal lobe is clavate and diminishes in size to setiger 47 after which it is low and rounded. The dorsal and ventral cirri are of equal length and are clavate. The ventral cirri are padlike from setiger 7.

Branchiae are present from the first setiger as a single filament. A second filament is present by setiger 30 and a third by setiger 39.

Bidentate and tridentate pseudocomposite hooded hooks are present in the first 5 setigers. Setigers 6–9 have only simple limbate setae. Two bidentate subacicular hooks are present from setiger 10. Pectinate setae are present in median setigers; each has 13 fine teeth. Composite spinigers are absent.

Maxilla I is falcate; maxilla II right has 10 teeth, II left has 8–9 teeth; maxilla III left has 10 teeth, IV left has 7 teeth; combined right maxilla III and IV has 10–11 teeth; each maxilla V has 1 tooth. Mandibles are bidentate.

Tube absent.

Discussion.—*Onuphis multiannulata* is related to *O. branchiata* Treadwell, 1931, *O. eremita* Audouin and Milne Edwards, 1833, and *O. quinquedens* Day, 1951. *Onuphis multiannulata* can be distinguished from *O. branchiata* and *O. eremita* by the number of occipital ceratophore annulations. *Onuphis multiannulata* has 20–23 annulations, *O. eremita* has 15–17 and *O. branchiata* has only 8 annulations. *Onuphis multiannulata* is most closely related to *O. quinquedens,* which has only bidentate anterior hooded hooks.

Distribution.—*Onuphis multiannulata* has been found off Santa Rosa Island and on the Tanner and Cortes Banks. It occurs in fine to coarse sand and has a bathymetric range of 95–142 m.

Disposition of types.—Holotype and paratypes are deposited in the National Museum of Natural History (USNM 63071, 63072, 63073).

Etymology.—The specific name is derived from the Latin "multus" meaning many, and the Latin "annulus" meaning ring; it is given because the ceratophores have many annuli.

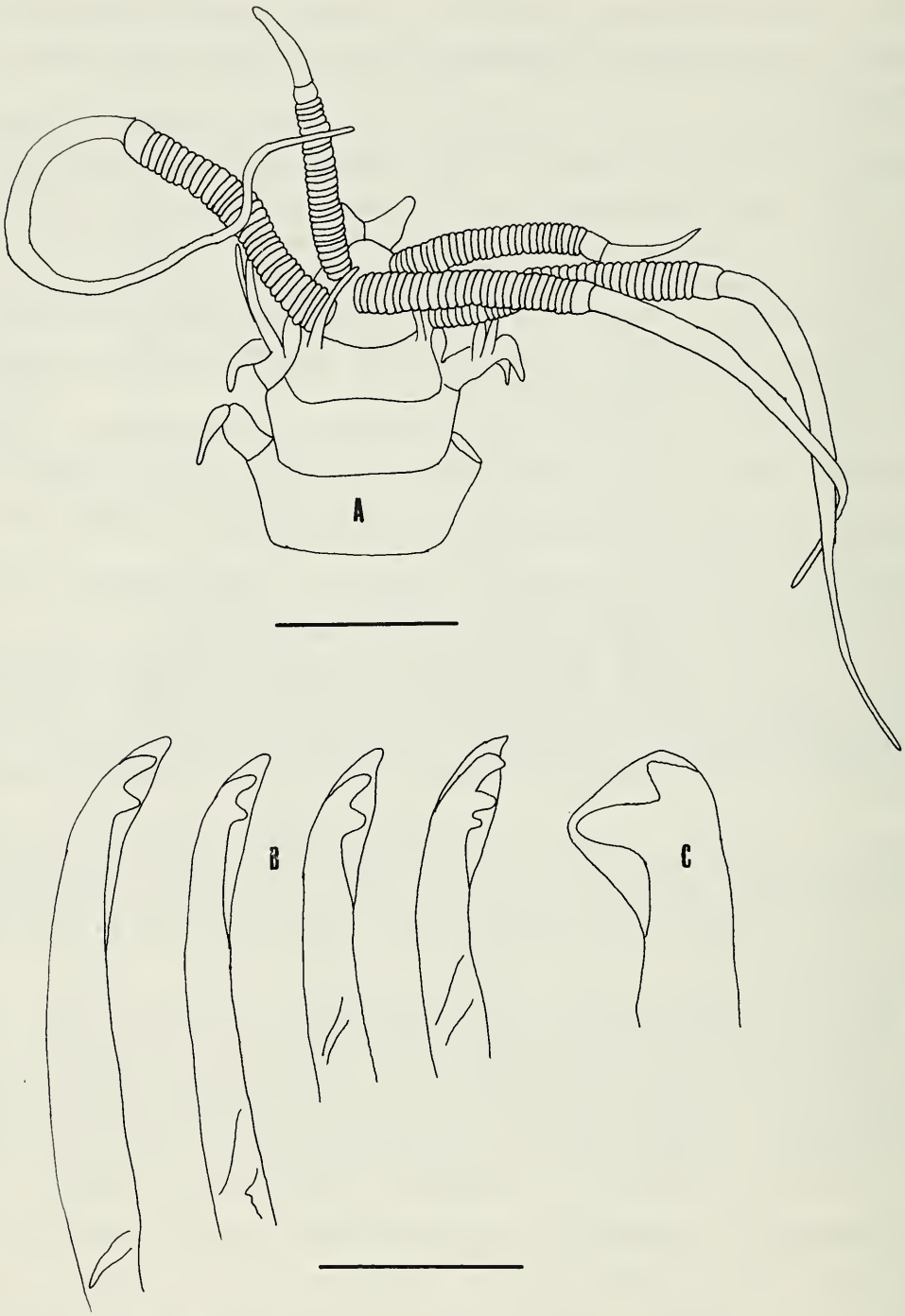

Fig. 4. *Onuphis multiannulata:* A, Anterior end, dorsal view; B, Hooded hooks, setiger 1; C, Subacicular hook, setiger 54. Scales: A = 1.0 mm; B–C = 0.05 mm.

Onuphis segmentispadix, new species
Fig. 5, Table 2

Material.—22966 (5); 22970 (8); 23000 (2); 23070 (6); 23071 (3); 23088 (4); 23098 (33); 23100 (2); 32102 (2); 23129 (5); 23241 (2); 23279 (111); 24075 (1);

24080 (4); 24100 (2); 24106 (4, type); 24108 (10); 24238 (2); 24240 (18); 24241 (1); 24253 (14); 24255 (2); 24259 (10); 24263 (40); 24268 (5); 24364 (1); 24368 (5); 24375 (25).

Description.—The type is incomplete with 68 setigers; it is 20 mm long and 1.5 mm wide including the parapodia. The dorsum is crossed by transverse brown bars through the first 31 setigers and is later pale. The peristomium is uniformly brown.

The prostomium is ovate with globular frontal antennae and palps. The ceratophores of the occipital tentacles have 4 annuli, the distalmost of which is equal in length to the combined lengths of the first 3 annuli. The pygidium, in a complete specimen, terminates with a pair of cirri. The style of the median occipital tentacle reaches setiger 11; the inner lateral styles reach setiger 10–12 and the outer lateral styles reach setiger 2–3.

Two pairs of eyespots are present. The anterior pair are located directly behind the frontal antennae; the posterior pair are lateral to the inner occipital tentacles; the anterior eyespots are poorly defined in the type but are clearly present in the paratypes.

The peristomium is narrower than the first setiger with the peristomial cirri being equal in length to the postsetal lobe of the first setiger.

The postsetal lobe of the first setiger is cirriform and it diminishes in size through setiger 14 behind which it becomes truncate and equal to the truncate presetal lobe. The setal lobe is rounded and extends beyond the presetal lobe. The ventral cirri are slender and cirriform in the first 4 setigers and padlike from setiger 5.

Branchiae are first present from setiger 9 as a single filament. A second filament is present from setiger 18. Four filaments in a pectinate arrangement are present at their maximum development.

Pseudocomposite tridentate hooded hooks are present in the first 4 setigers. These are accompanied by a few simple setae. Compound spinigers are present in setigers 5–15 in inferior positions with simple limbate setae in superior positions. Two bidentate subacicular hooks are present from setiger 16. Pectinate setae are present in median and posterior setigers; each has 10 coarse teeth. Each parapodium contains 3 slightly curved aciculae.

Maxilla I is falcate; maxilla II right has 8 teeth, II left has 8 teeth; maxilla III left has 8 teeth, maxilla IV left has 7 teeth, and combined right maxilla III and IV has 10 teeth. Each maxilla V has 1 tooth.

Tubes are very thin and transparent.

Discussion.—*Onuphis segmentispadix* is related to *O. cedroensis,* Fauchald, 1968. Both species have 4 ventral cirriform cirri, tridentate anterior hooks and 3–4 annulations on their ceratophores. These species can, however, be distinguished on the basis of the first appearance of the branchia and the presence of compound spinigers. The branchiae are first present in setigers 9–15 in *O. segmentispadix* whereas they are first present from se-

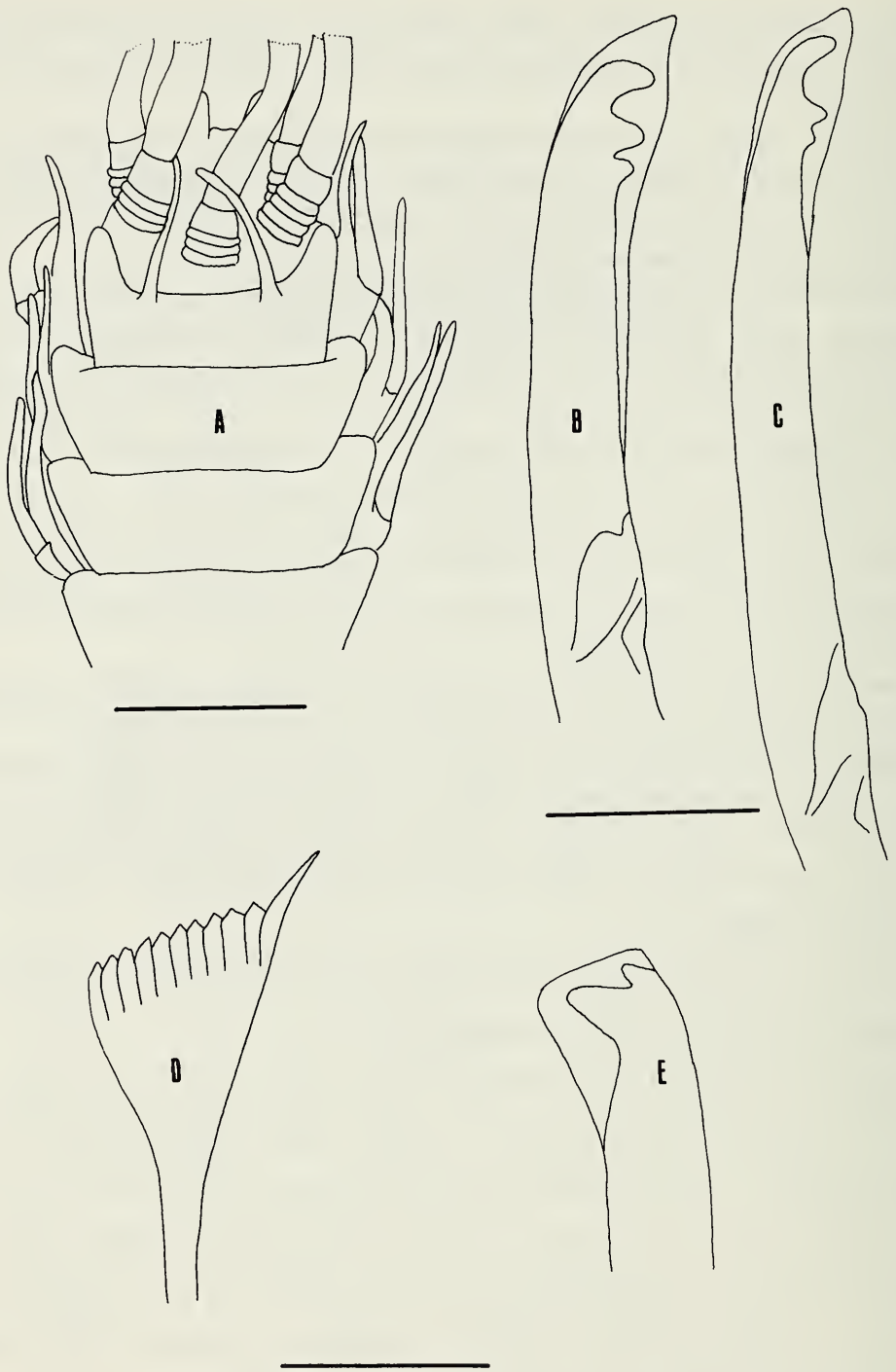

Fig. 5. *Onuphis segmentispadix:* A, Anterior end, dorsal view; B–C, Hooded hooks, setiger 1; D, Pectinate seta, setiger 1; E, Subacicular hook, median setiger. Scales: A = 0.5 mm; B–E = 0.025 mm.

tiger 6 in *O. cedroensis*. Compound spinigers are lacking in *O. cedroensis* whereas they are present in *O. segmentispadix*.

Distribution.—Onuphis segmentispadix is widely distributed off of the southern California coast. It has been found in substrates ranging from silt to coarse sand to gravel. It has a bathymetric range of 63–457 m.

Disposition of types.—Holotype and paratypes are deposited in the National Museum of Natural History (USNM 63074, 63075, 63076, 63077, 63078, 63079, 63080).

Etymology.—The specific name is derived from the Latin "segmentum" meaning segment or part, and the Latin "spadix" meaning nut-brown; it is given because the segments are dorsally brown in the anterior.

Acknowledgments

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Hyperion Treatment Plant, 12000 Vista del Mar, Playa del Rey, California 90291.

Appendix 1

		Station Data
22952	(103)	13 Oct. 1975, 33°51.46′N, 119°57.13′W, 87 m, coarse sand.
22958	(106)	14 Oct. 1975, 33°51.95′N, 119°59.98′W, 68 m, coarse sand.
22960	(108)	14 Oct. 1975, 33°51.92′N, 120°1.78′W, 61 m, fine sand with shell fragments.
22965	(113)	14 Oct. 1975, 33°52.8′N, 120°7.0′W, 83 m, coarse sand.
22966	(114)	14 Oct. 1975, 33°51.96′N, 120°8.1′W, 129 m, coarse sand.
22970	(138)	14 Oct. 1975, 33°51.6′N, 120°8.83′W, 396 m, medium sand.
22999	(153)	15 Oct. 1975, 33°49.98′N, 120°3.82′W, 100 m, medium to coarse sand.
23000	(165)	15 Oct. 1975, 33°48.97′N, 120°4.15′W, 127 m, fine sand with pebbles.
23004	(161)	16 Oct. 1975, 33°48.96′N, 120°0.9′W, 103 m, coarse sand.
23070	(173)	19 Oct. 1975, 33°41.7′N, 120°0.3′W, 124 m, medium sand with shell fragments.
23071	(174)	19 Oct. 1975, 33°40.94′N, 119°59.3′W, 129 m, medium sand with pebbles.
23077	(176)	19 Oct. 1975, 33°41.10′N, 119°57.4′W, 135 m, fine sand with pebbles.
23086	(179)	19 Oct. 1975, 33°39.99′N, 119°57.88′W, 140 m, medium sand with shell fragments.
23087	(177)	19 Oct. 1975, 33°39.99′N, 120°0.1′W, 120 m, sand and gravel.
23088	(178)	20 Oct. 1975, 33°39.82′N, 119°58.87′W, 129 m, fine sand and gravel.
23092	(182)	20 Oct. 1975, 33°39.0′N, 119°59.5′W, 133 m, coarse sand.
23093	(183)	20 Oct. 1975, 33°39.1′N, 119°58.17′W, 133 m, coarse sand.
23098	(188)	20 Oct. 1975, 33°38.6′N, 119°56.76′W, 299 m, fine to medium sand.
23100	(186)	20 Oct. 1975, 33°38.3′N, 119°59.9′W, 233 m, medium to coarse sand.
23102	(185)	20 Oct. 1975, 33°37.97′N, 119°59.99′W, 369 m, fine sand.
23129	(308)	4 Nov. 1975, 33°50.7′N, 120°10.94′W, 434 m, fine sand.
23170	(006)	6 Nov. 1975, 33°59.78′N, 120°22.33′W, 70 m.
23205	(084)	8 Nov. 1975, 33°52.94′N, 119°58.3′W, 65 m, fine sand and gravel.
23229	(204)	9 Nov. 1975, 34°23.97′N, 119°54.3′W, 41 m, silt and clay.
23241	(771)	10 Nov. 1975, 34°22.99′N, 119°51.1′W, 55 m, silt and clay.
23279	(070)	13 Nov. 1975, 33°53.98′N, 119°54.0′W, 166 m, medium sand.
24075	(436)	7 Jan. 1976, 33°29.2′N, 118°43.93′W, 414 m, fine sand.
24080	(439)	7 Jan. 1976, 33°29.1′N, 118°40.85′W, 225 m, fine to medium sand.
24081	(440)	7 Jan. 1976, 33°28.84′N, 118°39.87′W, 214 m, fine to medium sand.
24083	(432)	7 Jan. 1976, 33°29.98′N, 118°41.11′W, 275 m, silty and fine sand.
24084	(431)	7 Jan. 1976, 33°29.97′N, 118°42.5′W, 264 m, clay.
24089	(429)	7 Jan. 1976, 33°30.7′N, 118°44.7′W, 270 m, medium sand.
24100	(423)	7 Jan. 1976, 33°31.13′N, 118°42.99′W, 319 m, medium to coarse sand.
24106	(417)	8 Jan. 1976, 33°31.88′N, 118°41.95′W, 358 m, coarse silt and pebbles.
24129	(610)	9 Jan. 1976, 32°43.1′N, 119°4.86′W, 240 m, fine to medium sand.

Appendix 1

		Station Data
24140	(629)	10 Jan. 1976, 32°41.2′N, 119°9.97′W, 98 m, fine to medium sand.
24238	(028)	17 Jan. 1976, 33°58.3′N, 120°26.5′W, 135 m.
24240	(039)	17 Jan. 1976, 33°57.0′N, 120°25.5′W, 180 m, medium sand with shell fragments.
24241	(038)	17 Jan. 1976, 33°57.0′N, 120°23.95′W, 139 m, coarse sand and pebbles.
24253	(049)	17 Jan. 1976, 33°55.99′N, 120°23.98′W, 286 m, fine sand and silt.
24255	(051)	17 Jan. 1976, 33°55.91′N, 120°25.94′W, 345 m, medium to fine sand.
24259	(042)	17 Jan. 1976, 33°57.3′N, 120°28.5′W, 340 m, fine to medium sand.
24263	(040)	18 Jan. 1976, 33°56.97′N, 120°26.7′W, 246 m, fine to medium sand.
24268	(220)	18 Jan. 1976, 33°46.4′N, 119°50.1′W, 268 m, pebbles.
24356	(608)	17 Feb. 1976, 32°43.87′N, 119°9.86′W, 81 m, coarse sand.
24364	(584)	18 Feb. 1976, 32°35.79′N, 119°20.9′W, 129 m, fine to medium sand.
24365	(669)	18 Feb. 1976, 32°37.86′N, 119°16.77′W, 225 m, fine sand.
24367	(654)	18 Feb. 1976, 32°39.94′N, 119°14.96′W, 127 m, coarse sand.
24368	(647)	18 Feb. 1976, 32°40.97′N, 119°14.4′W, 390 m, silt and fine sand.
24375	(665)	18 Feb. 1976, 32°38.3′N, 119°12.97′W, 188 m, fine to medium sand with pebbles.
24380	(696)	18 Feb. 1976, 32°33.81′N, 119°16.61′W, 92 m, fine sand.
24382	(704)	18 Feb. 1976, 32°32.86′N, 119°17.64′W, 85 m, sand with pebbles.
24384	(720)	18 Feb. 1976, 32°30.99′N, 119°20.6′W, 144 m, sand with pebbles.
24754	(718)	2 April 1976, 32°31.1′N, 119°17.98′W, 100 m, fine to medium sand.
24759	(714)	2 April 1976, 32°31.0′N, 119°14.1′W, 89 m, medium sand.
24774	(575)	4 April 1976, 32°49.8′N, 119°29.86′W, 1357 m.